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Salicylate Therapy in Rheumatic Fever; A Rational Approach: The essential problem in the therapy of rheumatic fever is the prevention of disabling heart disease. If the rheumatic attack were always monocyclic, severe heart muscle damage would rarely occur. However, in young adults rheumatic fever is more commonly polycyclic and during each febrile phase of the cycle, severe inflammatory reactions take place in vascular tissues. These reactions continue as long as the antigen liberated by the respiratory pathogen (hemolytic streptococcus Group A) induces an abnormal antibody response in the rheumatic subject. So far no methods are available either for suppressing the elaboration of antigen by the bacterial agent or for modifying the constitutional defect of the host. The objective in the treatment of each patient must be to reduce cardiac damage to a minimum, and to effect this it is essential that the inflammatory reaction of rheumatic fever be suppressed.

The only drug that has survived for half a century in the treatment of rheumatic fever is salicylate, and yet its use is still empirical and there is no consensus as to its value. Most clinicians agree that this drug has a peculiar analgesic and antipyretic action in rheumatic fever but few feel that

salicylate modifies the progress of the disease process. There is no standard of dosage for the use of this drug and its administration to rheumatic children is frequently not advised. The reasons for this confusion in empirical salicylate therapy are apparent. Salicylate has no effect on the infectious agent, and there has so far been little evidence that the drug modifies the immune response of the patient with rheumatic fever. Salicylates, as ordinarily administered, therefore cannot be expected to alter the potential duration of rheumatic activity. If, however, a method of salicylate administration modifies the sterile inflammatory reaction which occurs during activity of the rheumatic process, one may expect this effect to inhibit the development of cardiac disease.

If one accepts the elevation of the blood sedimentation rate as an expression of inflammation in rheumatic fever, therapeutic measures which will reduce the sedimentation rate to normal as quickly as possible may be presumed to affect the inflammatory reaction itself. No therapeutic measure can be expected to reduce a markedly elevated sedimentation rate to normal limits within a week because the inflammatory reaction existing prior to treatment will have already induced the elaboration of serum globulins which give rise to the accelerated rate of sedimentation of erythrocytes in rheumatic fever. However, if one can modify the sedimentation rate curve so that it ceases to rise after 72 hours of treatment and then falls progressively, reaching normal values within 14 days, there is good reason to believe that the rheumatic reaction has been suppressed and that further cardiac damage will be inhibited.

In a previous communication (to be published) the author reported a method for determining the level of salicylate in the plasma. The question then naturally arose as to whether the effect on the rheumatic inflammatory reaction had any quantitative relation to the salicylate level.

Forty patients in the rheumatic fever ward of a naval hospital were selected for study. All were treated identically with the exception of the dosage of salicylates administered.

Twenty patients received either supportive treatment or sodium salicylate sufficient for the relief of symptoms. These patients were found to have plasma salicylate levels below 250 gamma per c.c.

The remaining patients were treated according to the following program:

- Day 1: 10 grams of sodium salicylate in 1000 c.c. of 0.9 per cent NaCl were administered by intravenous drip in four to six hours.
- Day 2: If the patient had any rheumatic symptoms or if the temperature had not reached normal, 20 grams of sodium salicylate were administered in 2000 c.c. of 0.9 per cent NaCl in eight hours.
- Day 3: The program of Day 2 could be repeated if necessary, but with the patient symptom-free and afebrile 10 grams of sodium salicylate were considered adequate.
- Day 4 to 6: Sodium salicylate infusions were continued daily until the blood sedimentation rate had dropped appreciably; e.g., 20 to 30 per cent.

Day 7 to 30: Oral therapy replaced intravenous treatment. Doses of 1.6 grams of sodium salicylate and 0.6 grams of sodium bicarbonate were administered every four hours day and night. A total of 10 grams of sodium salicylate was given daily during this period.

Day 30: After two weeks or more in which the sedimentation rates remained within normal limits, the patient was allowed a trial week of bed rest without any salicylates. If he remained symptom-free and maintained a normal sedimentation rate for one week, he was allowed up progressively and disposition was as described in the Naval Medical Bulletin, September and November 1943. If, however, the patient developed frank symptoms, fever or a marked rise in the blood sedimentation rate during this test week, another two weeks' course of therapy was given. This course was begun either with oral medication or one intravenous infusion of 10 grams followed by oral doses as outlined above.

By this method of administration the plasma salicylate level could be maintained at 350 gamma per c.c. or higher.

Frequent blood sedimentation rates and plasma salicylate determinations were carried out on all patients.

The twenty patients who were conservatively treated and whose blood levels were below 250 gamma all continued, as shown by persistently rapid sedimentation rate, to manifest an active inflammatory process. The twenty patients treated intensively, and with plasma salicylate levels of 350 gamma or over, all manifested a prompt and progressive subsidence of the rheumatic infection. The sedimentation rate failed to rise further after 72 hours of treatment and then fell progressively, reaching normal values within 14 days.

The observations suggest that a plasma salicylate level of at least 350 gamma per c.c. may be required to suppress the rheumatic reaction and that plasma levels below 200 gamma per c.c. may be sufficient to produce symptomatic relief while masking a progressive inflammatory process.

The results of two years subsequent experience with this technic showed that none of 38 rheumatic patients treated with 10 grams of sodium salicylate daily developed valvular heart disease and that 21 out of 63 similar cases who received only small doses of sodium salicylate developed physical signs of heart disease.

Swift et al (J. Clin. Invest, V, 427, '28) reported experiments which demonstrated the inhibitory action of salicylate on the formation of precipitins following the therapeutic administration of horse serum and the prevention of clinical allergic response (arthritis).

Immunological studies (Coburn and Kapp, J. Exper. Med., Feb. '43) have shown that sodium salicylate prevents the precipitation of antigen by antibody in vitro; that this effect is more marked as the concentration of salicylates

in the solution is increased; and that the immune system becomes progressively less sensitive to the action of salicylate as the excess of antibody becomes larger (more salicylates being required to offset antibody excess). It is possible that the large plasma salicylate concentrations achieved by the method of administration described above may be effective through suppressing in vivo the reaction between the antibody formed by the rheumatic subject and the antigen produced by the hemolytic streptococcus. (A.F.C.)

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The above abstract by the author summarizes a paper which will appear in a forthcoming issue of the Bulletin of the Johns Hopkins Hospital. If further observations bear out the value of high level salicylate dosage in modifying the sterile inflammatory reaction of rheumatic fever, especially rheumatic valvulitis, this work may well be regarded as a major advance in our treatment of this disease. Upon application to the Bureau a description of the technic of plasma salicylic acid determination will be furnished interested medical officers.

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ALNAV - 3 Nov 1943: In order to meet quarantine regulations government of India it is directed all personnel travelling through an endemic yellow fever area enroute to India be vaccinated against yellow fever and be provided with certificate showing inoculation completed not more than two years nor less than 14 days before entering that area. Those who fail to comply will be vaccinated and/or quarantined for required period of time.

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Beans and the Digestibility of Starch: Bowman, during the course of experiments dealing with the digestibility of dried navy beans, observed that the oil of these beans retards the digestion of soluble starch by pancreatic anylase in vitro. Butter, olive oil and lard had no such retarding effect. Further studies are under way. (Science, Oct. 1, '43.)

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Preservation of Whole Blood by the Addition of Glucose: At a recent meeting of the Subcommittee on Blood Substitutes of the National Research Council, it was agreed that either citrate or glucose-citrate is satisfactory for use in storing blood less than 5 days; that if glucose is used, blood can be safely given up to 3 weeks after drawing; and that the optimal storage temperature is 4° to 10° C. Temperatures higher than 10° C. are dangerous.

The Subcommittee recommended that "if blood is to be stored longer than 5 days, glucose, dilution and cooling be considered essential. In the light of present knowledge, three solutions have proven efficient: Alsever's, DeGowin's, and Denstedt's."

These solutions are prepared as follows:

A. Alsever's

Anhydrous dextrose	18.66 Gm.
Sodium chloride	4.18 Gm.
Dihydrous sodium citrate	8.00 Gm.
Distilled water to make	1000.00 c.c.

Autoclave and use 500 c.c. of solution to 500 c.c. of blood.

B. DeGowin's

Solution #1	Anhydrous dextrose	54 Gm.
	Distilled water to make	1000 c.c.
Solution #2	Dihydrous sodium citrate	32 Gm.
	Distilled water to make	1000 c.c.

Autoclave separately to prevent caramelization of the dextrose. A slight amount in no way interferes with the preservative qualities of the solution. Use 650 c.c. of solution #1, 100 c.c. of solution #2 to 500 c.c. of blood.

C. Denstedt's

Solution #1	Glucose	54 Gm.
	Distilled water to make	1000 c.c.
Solution #2	Dihydrous sodium citrate	32 Gm.
	Distilled water to make	1000 c.c.

Autoclave separately. Use 150 c.c. of solution #1 and 100 c.c. of solution #2 to 500 c.c. of blood.

Opinion obviously varies as to optimum dilution and tonicity of diluent. Alsever added sodium chloride, making a slightly hypertonic solution, to prevent formation of tiny clots. Denstedt believes any dilution above 1:0.5 is satisfactory for preservation of blood in vitro but that higher dilutions such as 1:1 or 1:1.5 increase erythrocyte fragility when used clinically.

The Alsever solution was used at the Naval Medical School during 1940. Five hundred c.c. of blood were collected into a 1250 c.c. flask and stored for 18 days. If the blood was not used during the storage period, the plasma was salvaged and stored for further use. The useful life of blood preserved by these methods is variously estimated from 14 to 70 days. Three weeks seems at least a safe estimate.

Any one of the above mentioned methods of preserving blood should be satisfactory for the small hospital. (S.T.G.)

Smaller Doses of Penicillin are Effective in Sulfa-resistant Gonococcus Infections: Results now indicate that the arbitrary schedule of dosage for penicillin which was first recommended is probably much higher than is necessary. From a large number of cases treated by the Army the following schedule has been developed: 5 intramuscular injections of 10,000 units each are given at 3-hour intervals: total dose - 50,000 units. Eighty-five per cent of the cases have been promptly cured. In the approximately 15 per cent failures a second intensive course of 10 intramuscular injections are given, 10,000 units each hour for 10 hours: total 100,000 units. All but a rare case has been cured. The Navy's series following a similar schedule is smaller in number but somewhat higher in initial cures resulting from the 50,000 unit dosage. The cures resulting from this dosage are as prompt and complete as from the 120,000 unit dosage.

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Penicillin and Syphilis: Apparent cures by penicillin of four cases of early syphilis were reported recently by Mahoney, Arnold and Harris of the U.S. Public Health Service. At a conference on Penicillin and Syphilis held recently at the National Research Council, considerable additional evidence, based on clinical and in vitro experimentation, was presented which tended to support the findings of Mahoney and his associates.

It was recommended at the conference that sufficient penicillin be allotted to a small number of adequately equipped civilian clinics for a carefully controlled study of the therapeutic value of this drug in syphilis. The Army and Navy will participate in this planned study. The center for Naval research on penicillin in syphilis has been designated as the National Naval Medical Center, Bethesda, Maryland.

It is hoped that this program will help to answer as quickly as possible some of the following questions: (1) Is penicillin an effective therapeutic agent in syphilis? (2) If so, what should be the dosage and the duration of treatment? (3) What are the chemical, therapeutic and toxicological aspects of combining penicillin and arsenicals in treating syphilis? (Experimental work leading to the answers to questions (2) and (3) will be conducted only in the civilian clinics.)

Inasmuch as any evaluation of the effectiveness of a therapeutic agent in syphilis requires months of continuous clinical and serological follow-up by the same group of observers, it may be some time before these questions can be answered. Until they are answered, penicillin should not be used clinically in the treatment of syphilis.

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Correction: The item entitled "Medical and Sanitary Data on India" (Army M. Bull., July '43.) published in the Bumed News Letter, October 15, Vol. 2, No. 8, was erroneously noted as having been prepared by the Public Health Service for the U.S. Army. It was prepared by the Medical Intelligence Branch, Preventive Medicine Division, Office of the Surgeon General, U.S. Army.

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Useful Blood Derivatives: Human serum albumin, already widely used in the armed forces, is the most important product of plasma fractionation. Its production on a large scale has stimulated research regarding the obtaining of valuable by-products from the globulin fraction. Among these are immune globulin fractions, thrombin and fibrinogen.

Thrombin represents by all odds the most potent local hemostatic agent available. When thrombin is applied to bleeding tissues by means of non-absorbable materials such as cotton or gauze, bleeding often recurs through injury to the clot incident to the removal of the cotton or gauze. Principally as a result of experimental work being carried on in Cohn's Laboratory at Harvard by Bering, and also by Ferry and Morrison, various absorbable substitutes for cotton and gauze have been made from fibrinogen. Fibrinogen can be stored frozen or dried and can be made into film, foam sponge or plastic. Fibrin foam sponges are in themselves hemostatic agents. However, their hemostatic action is greatly increased by soaking them in thrombin solution or by adding thrombin in their preparation. When used in brain or abdominal surgery for hemostasis, fibrin foam can be left in contact with the tissues. It absorbs rapidly with practically no inflammatory (foreign body) reaction. The reaction is less than that which occurs in connection with bone wax, catgut, black silk and muscle.

Fibrin film has been used to repair rents in the dura. In this location the films do not disappear. They do not lead to the formation of adhesions. Thrombin and fibrinogen have been used at the Naval Hospital at Norfolk (see next item) in skin grafting. Hemorrhage was easily controlled and the grafts adhered and did not slip.

While not a blood derivative, oxidized cellulose can be used as an absorbable substitute for cotton, paper and gauze. The absorbability of the oxidized cellulose varies with the length of the oxidation process. Difficulties in sterilization and in determining the optimum degree of oxidation have delayed its production. Kenyon is largely responsible for the development of this substance. Frantz has carried on in the pathological laboratory of Columbia University much of the experimental work with animals, while Putnam at the Neurological Institute in New York has used it, soaked in thrombin, for hemostasis in human brain surgery. Experimentally in animals oxidized cellulose paper has proved a satisfactory substance for repairing tears in the dura.

Rabbit thrombin is now being manufactured by Lederle. Parke-Davis are manufacturing beef thrombin but have not released it for other than experimental use. The various fibrinogen and oxidized cellulose preparations are not yet produced in sufficient quantity for other than experimental use. When available they should be useful in many types of surgery.

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The Use of Thrombin and Fibrinogen in Skin Grafting; Preliminary Report:
As a result of the work of Dr. M. E. Sano, Temple University School of Medicine, on the use of heparinized plasma and pressure as an adhesive for grafts, the possibility occurred that even better results might be obtained with thrombin and fibrinogen. Accordingly, during the past several weeks, eight patients

have been grafted with varying technics of application of these substances. Two conclusions are already evident: hemorrhage from the recipient and donor sites is quickly and easily controlled by the thrombin and the grafts are well anchored in place by the combined use of thrombin and fibrinogen so that fewer sutures or at times no sutures at all are necessary. Slipping of the grafts is greatly reduced. The technic is particularly useful with pinch grafts and flapstone grafts.

On the basis of the experience to date, the following technic was evolved:

1. Thrombin is supplied dried in vials requiring 5 c.c. of distilled water for regeneration.
2. Fibrinogen is supplied similarly.
3. Thrombin is applied as a spray.
4. Fibrinogen is applied by dipping the grafts or flooding the surfaces.
5. Bleeding from the donor site is controlled by thrombin.
6. The recipient site is cleansed by ether; exuberant granulations and undesirable scar tissue are removed by sharp dissection and bleeding controlled by thrombin, pressure and elevation.
7. The grafts are dipped in the fibrinogen solution and fitted on the site to conform to the defect. The area is then sprayed with thrombin and simultaneously flooded with fibrinogen and the pressure dressing applied immediately. (Most of the thrombin used in this work has been the rabbit "Hemostatic Globulin" supplied through the courtesy of the Lederle Laboratories, Inc. A limited amount of thrombin and all the fibrinogen used was human and supplied by courtesy of the Department of Physical Chemistry, Harvard Medical School. Some of the latter was redissolved, placed in smaller containers, refrozen and redried by the Blood Plasma Laboratory of the U.S. Naval Medical School.) (Cronkite, Lozner and Deaver, from the U.S. Naval Hospital, NOB, Norfolk; the Naval Med. Res. Inst. - to be published.)

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Atabrine Toxicity: At the National Research Council Conference on "Chronic Toxicity of Atabrine" on October 26, data was presented which indicated that atabrine in malaria-suppressive doses was nontoxic. Animals were run with two or three times the plasma concentration of atabrine attained by 0.4 or 0.6 gram per week (suppressive atabrine) and when sacrificed at the end of two years had shown no symptoms of toxicity nor did the tissues, particularly the liver, reveal any microscopical abnormality.

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American Atabrine Not More Toxic Than German: Loughlin et al have made a comparative study of American and German atabrine. They conclude that there is no appreciable difference in the clinical toxicity of atabrine dihydrochloride

made by American processes of manufacture from American basic materials and atabrine dihydrochloride manufactured from German basic material either by American or by German processes.

The clinical tolerance for the drug was not significantly different with two methods of administration of 0.4 Gm. weekly, e.g., 0.2 Gm. administered on Monday and Tuesday of each week and 0.1 Gm. administered on Monday, Tuesday, Thursday and Friday of each week.

Atabrine dihydrochloride administered in prophylactic doses of 0.4 Gm. weekly caused indisposition due to nausea, vomiting and diarrhea in approximately 2 per cent of man-days both in healthy and in ill subjects.

Certain minor symptoms, such as abdominal cramps and headache, occurred but were usually mild and infrequent.

All the healthy subjects receiving the dose of atabrine used prophylactically against malaria were able to carry on assigned duties during the period of medication with this drug. (War Med., Sept. '43.)

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Ophthalmic Injuries of War: Matthews divides war injuries of the eye into three categories: (1) traumatic injuries, (2) thermal burns and (3) chemical burns. Traumatic injuries include those due to blast, ocular foreign bodies and perforations of the globe, as well as orbital and related ocular injuries caused by flying missiles.

The substitution of aluminum-magnesium alloys for brass and steel in the manufacture of bomb and shell cases in the present war has resulted in a greater incidence of foreign bodies of low magnetizability. Foreign bodies of these materials become crusted with a white crumbly powder after several days' contact with the ocular fluids and produce little siderosis.

Matthews recommends the following treatment for traumatic injuries:

1. Anesthetize the eye with 1 per cent butyn sulfate solution or 0.5 per cent pontocaine hydrochloride solution.
2. Gently remove any superficial foreign bodies with a cotton wound applicator, moistened with boric acid solution.
3. Flush the eye with boric acid solution.
4. Close the eyelids and apply a fairly firm dressing, held in place by adhesive tape.
5. Evacuate the patient as rapidly as possible so that he may receive proper ophthalmologic care promptly.
6. Do not close the wound with sutures.

7. Do not excise any tissue protruding from the wound.

8. Do not cover the eye with a conjunctival flap, unless specifically equipped to do so.

The percentage of casualties due to thermal injury is far greater than in any previous war. Nearly all burns encountered involve the unprotected face and hands to greater or less degree, and unfortunately, the prevention of these burns is difficult. The lids are usually most severely affected.

Matthews recommends that immediate therapy be directed to prevention and treatment of shock. Burns of the face may be covered with clean towels, or one of the following medicaments may be applied: cod liver oil, 5 per cent sulfadiazine in a water-soluble emulsion, boric acid ointment or gauze impregnated with sterile petrolatum. For relief of pain an anesthetic may be instilled into the eye, e.g., 2 per cent butyn sulfate ophthalmic ointment or 1 per cent cocaine in castor oil.

Since ophthalmic burns are nearly always associated with burns of the face and extremities, general measures should be instituted. It is essential that the first-aid worker, doctor and nurse be masked and that their hands and surgical instruments be free from pathogenic organisms.

Luckily, ocular damage from the lung-irritant gases likely to be employed may be prevented by wearing the service gas mask. If the eyes are not protected by a gas mask, prompt but mild conjunctival irritation may be produced. This may be relieved by flushing the eyes with 2 per cent sodium bicarbonate or boric acid solution. Macular hemorrhages or thrombosis of the central retinal vein due to respiratory embarrassment may be encountered in cases of severe respiratory tract irritation.

In the treatment of any mustard victim the eyes should never be bandaged. The seriousness of these ocular lesions depends upon the degree of conjunctival and corneal involvement. In severe cases in which the patient is unable voluntarily to open his eyes and, therefore, may believe he is blind, it is important that the lids be forced open to demonstrate that vision is not lost. In all cases irrigation with canteen water is recommended in the field. Early and continued administration of atropine is recommended in all cases to prevent headache and deep ocular pain from ciliary spasm; 1 per cent atropine sulfate solution should be instilled hourly until mydriasis is induced and thereafter once daily. Dark glasses or an eye shade should be worn, or the patient should be confined to a dark room until the effect of the atropine wears off.

Suggested therapy for exposure to lacrimators is to remove the victim from the contaminated atmosphere and face him to the wind with the eyes open to hasten volatilization of the absorbed gas. Irrigation with water, boric acid solution or 2 per cent sodium bicarbonate solution will promote comfort.

Although screening smoke itself is non-irritating, solid particles of burning phosphorus may become embedded in cutaneous surfaces or in the conjunctiva, producing deep thermal burns. On application of copper sulfate solution, the particles of phosphorus are coated with cupric phosphide, oxygen is excluded and the particles are rendered inert. (War Med., Sept. '43.)

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The two war gases which produce severe eye injury and blindness are lewisite and the mustards. An ointment which carries 5 per cent of a chemical substance called BAL in a grease base has been provided for the prophylaxis of lewisite eye injuries. The chemical known as BAL unites with and neutralizes lewisite. The more promptly it is introduced in the ointment form, the more chance there is of retaining vision. If BAL is introduced in the first two or three minutes, only slight damage occurs and in most instances 90 per cent vision is retained. After 20 minutes such severe injury has occurred that the most one can expect is to retain simple sensitivity to light. However, up to 30 minutes BAL can and should be used with some hope of retaining eye structure and function. BAL ointment is carried on supply table under number S1-3361 in one-half ounce tubes. It may be noted that this same ointment will neutralize lewisite on the skin. It has been tubed as it is, without the ophthalmic tip, so that the rather large quantity contained in the tube may be used liberally externally on the skin as well as in the eye.

Mustard gas demands immediate and vigorous washing to prevent eye injury. There is no chemical antidote for mustard such as BAL for lewisite, and copious lavage with plain water to dilute and wash away the mustard which may have come into contact with the tissues is our only method of preventing severe injury to the eye.

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"Sanitube" is the trade-mark of a commercial product. This item does not appear in the Supply Catalog, Medical Department, U.S. Navy. The name should not be applied to any ointment prophylaxis which is being used or reported upon by medical officers in the Navy except where the product manufactured under the name, "Sanitube", may have actually been purchased and used. Legal provisions give the trade-mark owners and manufacturers of this ointment full right to the name. The Naval Medical Corps should not place itself in an embarrassing position by using a term which is improper, both from the medical and the legal viewpoint.

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Acclimatization to High Temperatures: It is well known that persons suddenly exposed to temperatures in excess of 90° F. suffer a greatly reduced working efficiency and exhibit a syndrome of varying severity depending upon the degree of heat and the work performed. Such persons must pass through a period of "acclimatization" before these symptoms abate and their efficiency is in a measure restored.

The term "heat exhaustion" (or "heat prostration") is usually applied to those situations where the intake of salt and water fails to make up for the excessive loss through sweat. The underlying physiological process is dehydration with, eventually, loss of sufficient fluid so that the blood volume is decreased. The body temperature may be lowered. "Heat cramps" may occur under similar circumstances and are probably related to a low level of chloride in the blood and tissues. The term "heat stroke" is used for those patients who, usually without excessive sweating or fluid loss, develop hyperthermia of marked degree. The above syndromes are not always clearly defined and may overlap.

The majority of individuals abruptly transferred from a temperate to an excessively hot climate exhibit certain symptoms and signs of intolerance when called upon to perform heavy work, even though they are maintained in proper water and salt balance. The symptoms will include flushing of the face, profuse perspiration, palpitation, fatigue, headache, vertigo, dyspnea, neuromuscular incoordination, mental apathy, and nausea. The physical signs are elevation of the body temperature, tachycardia, and lowered vasomotor tone as evidenced by instability of the blood pressure with a tendency toward postural hypotension. With graded work these symptoms can be overcome and acclimatization will result.

The human body loses heat through radiation, sensible and insensible perspiration, evaporation, respiration, urine and feces. At ordinary temperatures, seventy per cent of heat is lost by means of radiation and convection, but it is obvious that the higher the environmental temperature becomes, the smaller will be the percentage of heat so dissipated. At an air temperature of 98.6° F. heat loss without rise in body temperature by this means must cease, and were it not for sweat secretion and evaporation, the body would gain heat at higher temperatures.

Sweat is a weak solution of NaCl in water with traces of other salts and urea. When the secretion of sweat is very profuse and long-continued, the NaCl excretion produces (even when large amounts of water are drunk) a lowered chloride level in the blood and tissues. Severe cramps in the muscles of the limbs and abdomen result.

Research designed to aid in acclimatization to heat has to date been largely directed toward studies of fluid and electrolyte metabolism since water and salt balance are particularly affected.

The body has minimum water requirements for maintaining fluid balance which become greater with increased environmental temperature and the amount of work performed. Thus for strenuous work it has been estimated that a man requires 7 quarts of water per day when the temperature is 95° F., 9 quarts at 105° F., and 13 quarts at 115° F.

If the water lost by the body is not replaced, dehydration proceeds to a point where the blood volume becomes reduced to the level of circulatory failure. It has been found, moreover, that under certain conditions a man may become seriously dehydrated even with unlimited water available, simply because he cannot drink enough to supply his needs. This negative water balance is restored by drinking during the evening after the day's work has ceased.

Since the water requirements depend upon variable factors such as air temperature and humidity as well as work done, no generally applicable figures for water requirements of men in hot climates are of very practical value. It is important to remember that the minimum physiological water requirements for a given environment and activity cannot be reduced in any way, although a moderate negative balance acquired during the hours of activity may be made up during periods of rest. No amount of "acclimatization" can alter the amount of water eventually required. In other words, men cannot be "acclimated" to a reduced water ration over extended periods of time.

On the other hand, men transferred from temperate regions to a hot, environment become physiologically acclimated to a certain degree in other ways, and their performance in such an environment depends to a great extent upon this state of "acclimatization". Acclimated men are able to perform more work and exhibit lower body temperatures and a more stable blood-pressure than do unacclimated personnel. Men in good physical condition acclimate more rapidly to a hot environment than do those in poor condition.

Acclimatization to heat begins with the first exposure, and is said to be fairly well developed by the third or fourth day. Although simple exposure to heat results in the development of a certain degree of tolerance, working in a high temperature is said to be necessary for any great degree of acclimatization. Thus, by progressively increasing the work load, acclimatization may be most quickly attained. This process is but poorly understood and is physiological in nature, probably involving an adaptation of cardio-vascular response to high temperature.

The occurrence of heat exhaustion when a man is first exposed to high temperature does not retard the rate of acclimatization, provided he be permitted to rest when symptoms first appear and adequate salt and water are administered. Failure to supply adequate salt and water will delay acclimatization. Adequate sleep and rest are considered of primary importance for personnel, even when well acclimated. Sick or ill men acclimate poorly or not at all.

Acclimatization is retained for periods of a week or more, after which it is lost at varying rates, up to a month after return to a temperate environment. Here, again, good physical condition is of value, since well-conditioned men retain their acclimatization over longer periods than do those in poorer condition.

Temperature appears to be the most important single factor in inducing acclimatization, since training in hot, dry (desert) environments increases the ability of men to perform strenuous work in hot, humid (jungle) areas.

The pre-acclimatization of men destined for tropical service has been suggested as a means of increasing the efficiency of troops beginning their service in hot climates, but practical considerations have thus far kept such a program from being instituted in general service use. (E.L.C.)

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The Diagnosis of Influenza and Catarrhal Fever, Acute (A Plea for Accurate Diagnosis) will be the subject of a paper by Krueger in a forthcoming issue of the Naval Medical Bulletin. Between December 1942 and May 1943, he and the medical officers associated with him had occasion to observe several hundred patients at a large West Coast Naval Dispensary, all of whom had entered with a diagnosis of "catarrhal fever, acute." Included under this diagnosis were found cases of influenza, atypical pneumonia, lobar pneumonia, septic sore throat, acute follicular tonsillitis, acute laryngotracheitis, acute bronchitis, rubella, and the common cold.

The Bureau makes use of the diagnostic material obtained from the F cards for the study of epidemic trends and of measures for the prevention of communicable disease. Accuracy in differential diagnosis of diseases of the upper

respiratory tract will greatly improve the value of the statistical material with which they must work.

Kreuger calls attention to the clinical points of difference between influenza and catarrhal fever. In the former the onset is more abrupt, and constitutional symptoms rather than respiratory symptoms predominate. The cough of influenza is usually shorter and drier and epistaxis is frequent. A posterior pharyngitis occurs, but with little soreness. The temperature in influenza may be diphasic. Unlike the variable clinical picture of catarrhal fever, that of influenza is uniform, though graded in severity. Although final diagnosis of the type of influenza has to be made by the isolation of the specific influenza virus from the rhinopharynx or by a rise in antibody titer to that virus, influenza is a diagnosis that can be made clinically with a considerable degree of accuracy.

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Penicillin: Its Antibacterial Effect in Whole Blood and Serum for the Hemolytic Streptococcus and Staphylococcus Aureus: The antistreptococcal and antistaphylococcal activity of whole blood is increased by the addition of sulfonamides. This increase in activity occurs in whole defibrinated blood to which sulfonamides have been added in vitro and in the blood of normal individuals who have taken these drugs by mouth or parenterally. Rammelkamp and Keefer found that the addition of penicillin to whole blood in vitro similarly resulted in a marked increase in the antistreptococcal and antistaphylococcal activity. Results obtained with whole blood or serum taken from normal subjects who had been given penicillin were identical.

In general, blood or serum containing adequate amounts of penicillin killed all the streptococcal organisms in even the largest inoculum of hemolytic streptococci. This is in distinct contrast to the action of adequate amounts of penicillin on Staphylococcus aureus, since with the latter organism all the bacteria are not killed on the addition of a large inoculum to blood or serum. This observation may have an important bearing on the use of penicillin in the treatment of staphylococcal infections in man, and suggests that adequate concentrations of the antibiotic substance should be maintained in the blood stream for a long period of time in order to ensure the complete killing of all staphylococci.

Hobby has shown that penicillin exhibits a greater antibacterial effect than sulfathiazole when tested against the hemolytic streptococcus in broth cultures. The present studies have demonstrated also that when penicillin is added to whole defibrinated blood, the antistaphylococcal and antistreptococcal effect is greater than when the sulfonamide drugs are added. Similar results were obtained on testing the blood of normal subjects after the administration of penicillin or sulfadiazine. However, the antibacterial action of blood after a single injection of penicillin in man is of relatively short duration, since it is excreted rapidly in the urine and a small amount is destroyed in the body. In the treatment of clinical infections, then, penicillin must be given frequently

and in adequate doses in order to maintain sufficient concentrations in the body to exert an antibacterial effect.

In patients with staphylococcal bacteremia or localized infections caused by *Staphylococcus aureus*, the blood or local lesion may not be sterilized for several days after the institution of penicillin therapy. That such an observation should be made might have been predicted from the "in vitro" studies of the effect of penicillin in whole blood on a large inoculum of staphylococci. As it has been demonstrated that sulfonamide-resistant pneumococci are readily susceptible to the action of penicillin, it would appear that the mechanism of antibacterial action of penicillin and that of the sulfonamide compounds are different. This suggests that a combination of sulfathiazole or sulfadiazine with penicillin might prove more effective than either compound alone in the treatment of staphylococcal infections. Preliminary observations in Dr. Keefer's laboratory indicate that the addition of a small amount of penicillin, which in itself is inadequate to kill staphylococci, will enhance the anti-staphylococcal effect of sulfathiazole in whole defibrinated blood. (Rammelkamp and Keefer, J. Clin. Invest., Sept. '43.)

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Penicillin and Malaria: Several cases have been reported verbally in the National Research Council Committee Meetings in which malaria has developed during penicillin therapy for such conditions as osteomyelitis, which indicated what one would expect: no effect on the plasmodia.

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Phosphatase Test for Pasteurized Milk: The Phosphatase Test is of great value in determining whether or not milk has been properly pasteurized. It was first reported by Scharer. (J. Dairy Sci., XXI:21, Jan. '38.)

Briefly the test depends upon the following points:

1. The enzyme phosphatase is present in all raw milk as well as in blood, urine, saliva, and other body fluids.
2. Proper pasteurization causes its complete disappearance or inactivation.
3. The test for the presence of the enzyme phosphatase is, in its essentials, relatively simple and depends upon the liberation of phenol from a phenolphosphoric acid ester and the development of a blue color roughly proportionate to the amount of the enzyme present. This blue color, in turn, indicates under-pasteurization and according to the elaborateness of the test, it indicates very accurately (laboratory test) or roughly (field test) the degree of underpasteurization.

The test is so very valuable because it will detect as little as 0.5 per cent raw milk contamination of pasteurized milk, or it will detect under-heating of only a few degrees or of shortening of the "holding" time of only a few minutes.

Failure in proper pasteurization is more often due to accidents in the dairy plant or carelessness on the part of handlers than to evil intent, but

whether the failure is due to inaccurate thermometers, foaming or incomplete mixing or stirring in the vat, or whether raw cream is added to bring the pasteurized milk up to proper fat percentage, the phosphatase test is the third degree. It answers the question: Has this milk been properly pasteurized?

Low bacterial counts are not per se evidence of pasteurization. Added formaldehyde does not interfere with the phosphatase reaction. Only phenol or cresol could cause a false positive reaction.

Principles of Test: Unpasteurized milk contains an enzyme known as phosphatase, or more correctly termed phosphomonoesterase, which enzyme is readily destroyed by heating at 142° - 143° F. for 30 minutes. This enzyme destruction is, more or less, directly proportional to the time as well as the temperature of pasteurization. The holding method of pasteurization is the one most widely used in this country; it requires that milk or cream be subjected to a temperature of 142° - 143° F. for at least 30 minutes. The ability of the milk enzyme (phosphomonoesterase), present in raw or improperly pasteurized milk, to split phosphoric acid esters is applied here in testing milk or cream to determine if it has been properly pasteurized. In this method the phenol, which is liberated quantitatively from the ester disodiumphenylphosphate by the enzyme, is estimated. In other methods (blood) for the estimation of phosphatase, the inorganic phosphate liberated is estimated. In either case, the phosphatase is thus measured.

Chemical Reactions of Test: The disodium-phenyl-phosphate ($C_6H_5Na_2PO_4$) is hydrolysed by the enzyme phosphatase liberating phenol from the former.

The BQC reagent (2,6 dibromo-quinone-chloroimide-- $C_6H_2OBr_2NCl$) then reacts with the liberated phenol producing the blue colored compound indo-phenol-blue.

Practical Value of Test: The field test can be completed in 30 minutes or less and the appearance of any blue color in this test is indicative of improper pasteurization. The laboratory (quantitative) test is employed where one wishes to know the amount of enzyme present in the milk or cream. Only the field test will be described here.

Reagents

Borate buffer solution: Dissolve 28.427 grams of sodium borate, reagent grade ($Na_2B_4O_7 \cdot 10H_2O$) in 900 c.c. of distilled water. Stir vigorously while powder is being added to prevent lumping. Add 3.27 grams of sodium hydroxide in the form of a strong solution (2 to 5 normal), cool and make up to 1,000 c.c. with distilled water.

Buffered substrate solution: Dissolve 1.09 grams of disodium-phenyl-phosphate in 900 c.c. of distilled water which has been previously saturated with chloroform. Add 50 c.c. of borate buffer solution and dilute to 1,000 c.c. with distilled water. Add a few drops of chloroform. Store in refrigerator. The pH of this buffer solution should be about 9.6 and should be checked using thymol-phthalein as an indicator.

Should this reagent produce a blue color with the BQC reagent described below, it should be discarded and fresh reagent prepared. It has been found that some samples of disodium-phenyl-phosphate contain some free phenol. Should this occur the salt should be washed with ethyl ether (USP) until the washings give a negative test for phenol. In making this test for phenol add 10 c.c. of distilled water to 100 c.c. of ether washings, evaporate off the ether, add 0.5 c.c. of the borate buffer solution and 0.08 c.c. of the BQC reagent. The development of a blue color indicates the presence of phenol. The washed, phenol-free salt should be briefly air dried, then dried in a desiccator and stored in a refrigerator.

BQC reagent: Dissolve 0.04 gram of 2,6-dibromo-quinone-chloroimide in 10 cc. of 95 per cent ethyl alcohol. This solution is stable for several days when kept tightly stoppered in a dark bottle. It is safer, however, to prepare this reagent fresh at least once a week.

Note: The chemicals for the preparation of the above reagent solutions may be purchased from the following firms:

Sodium Borate.....Merck & Co.
Disodium-phenyl-phosphate.....Eimer & Amend.
2,6-Dibromo-quinone-chloroimide.....Eastman Kodak Co.

Compressed tablets for preparing the buffered substrate solution and the BQC reagent may be purchased from R.P. Cargille, 118 Liberty St., New York, N.Y. One tablet of buffered substrate solution dissolved in 50 c.c. water is sufficient for 10 tests. The activity of this solution is destroyed by heat. One tablet of BQC reagent dissolved in 5 c.c. ethyl alcohol is sufficient for 30 tests or more. The activity of this reagent is destroyed by heat and light. Both solutions as made from tablets are good for only 1-2 days.

Technic of the Field Test:

Methods

1. Place 5 c.c. of buffered substrate solution in a pyrex test tube (15 by 125 mm.).
2. Add 0.5 c.c. of milk. Stopper and shake well.
3. Incubate for 10 minutes in water bath at about 100° F.
4. Remove from water bath and add 0.12 c.c. of BQC reagent solution. Stopper and shake well.
5. No blue color should develop after standing 5 minutes. The appearance of any blue color is indicative of improper pasteurization.

Properly pasteurized milk may show a gray to light brown color with this test. Raw milk will show a very dark blue; the intensity of the blue color is directly proportional to the degree of improper pasteurization or the percentage of raw milk present. This test will be positive wherever the Laboratory (quantitative) tests show 5 units or more of phosphomonoesterase.

6. A blank test should be run daily on the reagents alone. If the blank test produces any blue color, the buffered substrate solution should be discarded. (Hall and Gault, Nav. M. Bull., Jan. '40.)

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Macy Foundation Reprint Service: Medical officers of the armed forces of the United Nations wishing to receive the reprints of important current medical articles which are being distributed free of charge by the Josiah Macy Jr. Foundation in collaboration with the National Committee for Mental Hygiene and the National Research Council, should send their names and addresses to the Josiah Macy Jr. Foundation, 565 Park Avenue, New York, 21, New York. Please indicate special fields of interest.

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Survival on Land and Sea: "In time of war there are occasions, apart from those arising in actual combat, when individuals or small groups of men may find themselves strictly on their own and faced with the problem of getting out of unexpected and unpleasant situations as best they can. Ships are sunk and planes make forced landings at sea, setting men adrift in lifeboats or on rafts to float for days and weeks before being picked up, possibly even to become castaways on unknown shores. Pilots bail out over strange lands and come down in isolated regions; transport planes crash far from their bases; shore parties or Marine patrols become separated from their sources of supply and are unable to make contact with their fellows. When such things happen the men usually have a minimum of equipment and are in surroundings with which they are not familiar. Under these conditions questions arise. What do we do? What do we drink? What do we eat? How do we find our way to friends and safety?"

The bibliography which has accumulated on this subject is large. Most of the volumes are couched in technical language and deal with limited parts of the world. A book on tropical fish would be of little use to an aviator forced down in the Arctic, and a monograph on how to make friends with the Eskimo would be of doubtful value on a raft in the South Pacific.

The Ethnographic Board of the Smithsonian Institute has prepared for the Navy a monograph entitled "Survival on Land and Sea." It is a simply written, helpful guide designed for the use of any one anywhere. It is as compact as its scope will allow, since it brings together all of the available useful information regarding survival in different parts of the world.

The first chapter on "Men Against the Sea" starts with abandoning ship and then, after describing the procedures to be followed in rescue craft, goes carefully into instructions regarding exposure at sea, drinking water, food and fishing. There is a great deal of helpful information about navigation without instruments of precision.

"Landfall and Island Survival" form the topic of the next section. How to protect oneself from the sun, quenching thirst, using the coconut for many purposes, what fish to eat and what fish to avoid and how to recognize their differences are among the topics discussed.

There is a useful chapter on how to handle natives, not only so that they will aid one in getting back but also so as not to leave them with a bad impression that will influence adversely their reception of the next survivor.

Tropical forestry is discussed in detail with information about snakes, crocodiles and blood worms.

The final three chapters of the book are devoted respectively to the tropics, the arctic, and the desert. They deal with such subjects as food (including detailed descriptions of edible animals, birds, fish and plants), poisonous plants, water, clothing, fire-making and ailments peculiar to the type of country.

The book is of practical value and should be read by everyone whose duties expose him to the hazards of being forced to use his own efforts toward survival. It is, in addition, interesting reading.

The monograph is now in press and will be distributed in the near future.

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Research Projects: The following projects have been completed at the Naval Medical Research Institute during the month of September, and reports are available to medical officers by request to the Institute:

Control of Bacillary Dysentery and Cholera by Use of Bacteriophages.

Acute and Chronic Toxicity of Dihydroquinine.

Testing of H II RD Goggle for Fogging.

Investigation of Rhythmic Fluctuations Appearing in Dark Adaptation Curves and Their Influence on Reliability of Form Perception Tests.

Salt Tablet for Hot Environment, Improvement of, To Eliminate Gastro-intestinal Irritation.

The Evaluation of Certain Ointment Bases for the Treatment of Burns.

Study of British Bail-out Oxygen Equipment.

Comparison of Rates of Dark Adaptation Under Red Illumination in Total Darkness.

Micro-Crystalline Sulfathiazole As An Aid In The Treatment of Paradentosis (Pyorrhea Alveolaris).

Investigation of Mildew in Mattresses When Encased in Bedding Bags and Exposed to Tropical Weather Conditions.

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CHEMICAL WARFARE AGENTS AT A GLANCE

RESTRICTED

Bumed News Letter, Vol. 2, No. 10

<u>AGENT</u>	<u>ODOR</u>	<u>APPEARANCE</u>	<u>PERSISTENCY</u>	<u>EFFECT</u>	<u>PROTEC- TION</u>	<u>FIRST AID</u>
<u>Vesicants</u> MUSTARD	Garlic Horseradish	Dark oily liquid Colorless Gas	1 to 20 days	Blisters; irri- tates eyes and lungs.	Gas	Remove or cut away contaminat- ed clothing. Blot (do not rub) liquid from skin. Apply ointment. Wipe off and repeat two or three times. Then wash with soap & water. Rinse eyes with water.*
NITROGEN MUSTARDS	None or little Soapy-fishy	Oily liquid or soft solid	1 day to sev- eral weeks.	Blisters; irri- tates eyes and lungs; affects blood and nerves.	Mask	
LEWISITE	Geraniums	Dark oily liquid Colorless Gas	1 to 7 days	Blisters; irri- tates eyes and lungs; causes lacrimation.	Protec- tive	
ETHYLDI- CHLORARSINE	Biting Irritant	Clear oily liquid Colorless Gas	1 to 12 hours	Blisters; irri- tates eyes and lungs; causes lacrimation.	Cloth- ing	
<u>Lung Irritants</u> CHLORPICRIN	Flypaper Anise	Yellow oily liquid Yellow Gas	6 to 12 hours	Causes severe coughing; also eye irritant.	G A S	Wash (do not rub) eyes; keep quiet and warm.
PHOSGENE	Musty hay Green Corn Ensilage	Colorless liquid Colorless Gas	1 to 10 minutes	Causes coughing and choking	M A S K	Keep quiet and warm. Lie down. Loosen clothes. Give non- alcoholic stimulants.
DIPHOSGENE	Same	Same	30 minutes	Breathing hurts; toxic; also eye irritant.		
CHLORINE	Pungent Chemical	Yellow liquid Yellow-Green Gas	10 minutes	Immediate choking		
<u>Systemic Poisons</u> HYDROCYANIC ACID	Almonds	Colorless Gas	1 to 10 minutes	Dizziness, head- ache, convul- sions, paralysis.	G A S	Artificial respiration
ARSINE	Almost Odor- less	Colorless Gas	1 to 10 minutes	Dizziness, vomiting; affects blood.	M A S K	Keep quiet. Give water or nonalcoholic stimulants.

(Chemical Warfare Bul., Aug. '43.)

*Lewisite casualties use BAL ointment for eyes and skin. (Ed.)

CHEMICAL WARFARE AGENTS AT A GLANCE (Cont.)

RESTRICTED

Bumed News Letter, Vol. 2, No. 10

AGENT	ODOR	APPEARANCE	PERSISTENCY	EFFECT	PROTEC- TION	FIRST AID
<u>Lacrimators</u> CHLORACETO- PHENONE	Apple blossoms	Colorless Gas	10 minutes	Eyes smart; tears flow; also irritates skin.	G A S	Face wind. Don't rub or bandage eyes. For Brombenzyl- cyanide, wash with boric acid.
CHLORACETO- PHENONE (solution)	Sweetish	Liquid Colorless Gas	1 to 50 hours	Same	M A S K	
BROMBENZYL- CYANIDE	Sour fruit	Dark brown oily liquid	Days to weeks	Eyes smart, tears flow	K	
<u>Irritant Smokes</u> ADAMSITE	Little odor Coal smoke	Yellow green Granules Yellow smoke	10 minutes	Violent sneezing, headache, nausea, temporary mental depression.	G A S	Loosen clothes. Lie down in shade.
DIPHENYL- CHLORARSINE	Shoe polish	White crystal- line solid Vapor or fine smoke	10 minutes or longer	Sneezing, sick, depressed feel- ing.	M A S K	
<u>Screening Smokes</u> WHITE PHOSPHORUS	Burning Matches	Yellow solid White Smoke		Solid particles burn skin	Gas	Put and keep wet rag on affected skin.
HC MIXTURE	Sharp, acrid	Grey solid Grey smoke		Comparatively harmless	Mask	
TITANIUM TETRA- CHLORIDE	Mild, acrid	Yellowish to brown liquid White Smoke		Same	in High	
SULFUR TRIOXIDE (in chlorsul- fonic acid)	Acrid burn- ing matches	Dense white smoke		Irritates Skin	Con- centra- tions.	Wipe off any liquid and wash.
CRUDE OIL	Oil	White or grey smoke		Comparatively harmless		
<u>Incendiaries</u> THERMIT	None	Molten Metal		Ignites material Burns skin.		Treat for burns.

(Chemical Warfare Bull., Aug. '43.)

OFFICE OF THE SECRETARY

General Order
No. 191

28 May 1943

To: All Ships and Stations.

Subj: Annual Physical Examinations.

1. General Order No. 177 is hereby superseded.

2. Annual physical examinations as conducted in the past are not feasible under present conditions. It is, however, considered necessary that each officer and nurse receive a complete and careful physical examination at least once in each calendar year and that prompt and effective steps be taken to correct any conditions which may adversely affect the individual's efficiency. To this end commanders of fleets, forces, and Marine Corps organizations, and commandants of Naval Districts, and commanding officers of independent stations shall provide for the appointment of boards of medical officers in appropriate units or subdivisions of their commands to conduct physical examinations at such times as the exigencies of the service may permit. Where practicable these boards shall consist of not less than two medical officers, one of whom shall be a flight surgeon or qualified aviation medical examiner when flying personnel are to be examined.

3. All officers and nurses shall receive a complete physical examination during each calendar year. The examination shall be conducted with a view to discovering physical or nervous ailments which might impair the individual's efficiency under present conditions of service. In the case of flying personnel the examination shall be made to determine the individual's fitness to perform aviation duties. The medical examining board in each case shall enter in the health record the date and the result of the examination. Should defects be discovered which are regarded as sufficient to impair the examinee's ability to perform his duties, the board shall describe them fully in the health record and in addition shall submit a report of the examination to the Bureau of Medicine and Surgery on NMS Form Y, except that in the case of flying personnel who are found unfit for aviation duties or when a change in their flight service group appears indicated the complete report shall be submitted on NMS Av-Form 1. Individuals on duty where examination by a Naval medical officer is not practicable shall endeavor to obtain an examination by a medical officer of some other Federal department or of an allied government. Travel or other expenses shall not be incurred in connection with such examinations unless specifically authorized. The results of these examinations will be submitted to the Bureau of Medicine and Surgery separately by letter. Should it not be practicable to obtain an examination prior to December 31 of any calendar year, the individual concerned shall report the state of his health to the Bureau of Medicine and Surgery by letter.

4. Should conditions be discovered which temporarily or indefinitely unfit the individual for performance of his duties, and in the case of flying personnel for aviation duties, appropriate action shall be taken locally as promptly as may be practicable. In arriving at conclusions and making recommendations medical examining boards shall evaluate any defects discovered in relation to the duties to which the officer may be assigned. They shall not recommend immediate hospitalization for the correction of minor conditions which do not adversely affect the officer's efficiency in performing his duties. Correction of such defects should be deferred until such time as the services of the officer concerned can best be spared from the unit to which he is attached.

5. As soon as practicable after the end of any calendar year, medical officers having custody of officers' health records shall forward to the Bureau of Medicine and Surgery the medical history sheets containing entries, together with a letter of transmittal. The medical history sheets so forwarded shall contain an entry indicating the results of examination made in accordance with this letter or the date and purpose of any previous examination made during the previous calendar year. The full name and rank and the place and date of birth shall be entered on each medical history sheet.

6. Commanding officers should carefully observe the officers attached to their units with a view to detecting any impairment of health. If such condition appears evident, the facts should be brought to the attention of the medical officer. When the circumstances warrant, the officer in question should be ordered to appear before a medical examining board for examination to include such special diagnostic procedures as may be indicated. Report of such an examination shall be submitted to the Bureau of Medicine and Surgery on NMS Form Y or NMS Av-Form 1, as may be appropriate, and shall contain a statement showing the action taken in the case.

7. Medical officers should be alert at all times to detect any impairment of the health of the individual officers of the units to which they are attached and should promptly advise their commanding officers of any evidence of decrease in efficiency due to ill health and make appropriate recommendations. They should also be alert to detect impairment of mental vigor and endurance among the officers of the unit as a whole resulting from current operating conditions. They should keep their commanding officers advised and make appropriate recommendations with a view to preventing physical or nervous ailments which may result from continuous intensive mental or physical effort.

FRANK KNOX
Secretary of the Navy

BUREAU OF MEDICINE AND SURGERY

To: All Ships and Stations

BUMED-C-LET
JJ57/HJ(013-42)Subj: Acceptance by Medical Department of Red Cross
Supplies and Services.

4 Oct 1943

1. In general the policy for acceptance by the Medical Department of Red Cross supplies and services is as set forth in section VI, appendix C, Manual of the Medical Department, as follows:

"Medical and surgical supplies and equipment may be accepted from Red Cross representatives when authorized by the Bureau of Medicine and Surgery or in advance of such authority when an emergency exists. As a rule no supplies shall be accepted from the Red Cross which can be obtained through regular Navy procedure."

2. It is not intended that the Red Cross shall duplicate or parallel the work of the Medical Department in the procurement and distribution of medical supplies. Standard medical supplies procured by the Red Cross will be held as a reserve to meet unforeseen emergencies or to supplement standard medical supplies in grave situations. In other words:

(a) When time and other circumstances permit, Medical Department supplies and equipment shall be obtained through the regular naval medical supply channels.

(b) In emergency, Medical Department activities may call on the Red Cross field directors or local Red Cross chapters for medical aid--supplies and services, inclusive of nonstandard or less essential remedial supplies which cannot be obtained immediately through usual channels.

(c) Medical Department activities normally are expected to process their own dressings, bandages, etc., from materials obtained through the regular naval medical supply channels, except that activities such as ships fitting out may utilize their commissioning outfit of surgical dressings to supply local Red Cross chapters for the preparation of surgical dressings for the particular ship.

(d) Supplies of surgical dressings, bandages, etc., produced by the Red Cross are held for release through the commandants of the several naval districts. Requests from Medical Department activities for such dressings for emergency use or quickly to supplement stocks on hand should be made on the nearest district commandant. The commandants (district medical officers) are requested to review these requisitions and arrange with the Red Cross for issue or take such other action as may be indicated.

3. Battle dressings (pack, abdominal; pad, combination; sponge, surgical) manufactured by the American Red Cross are held for Navy use as follows:

On order of Commandant, Twelfth Naval District:

American Red Cross Warehouse, 1543 Mission St., San Francisco, Calif.

American Red Cross Warehouse, Interstate Terminal Warehouse Co.,
24th and Wall Ave., Ogden, Utah.On order of Commandant, Third Naval District:

American Red Cross Warehouse, 26 Exchange Place, Jersey City, N.J.

On order of Commandant, Sixth Naval District:

Atlanta Chapter, American Red Cross, 850 Peachtree St., Atlanta, Georgia.

4. Except when specifically directed by BuMed or as authorized in paragraph 2(c) of this letter, Medical Department activities will not issue Navy material for Red Cross processing.

5. The establishment of this policy is necessary to obtain a regular and standardized procedure which will be fully understood both by the Navy and the Red Cross.

ROSS T. McINTIRE
Rear Admiral (MC), USN
Chief of Bureau

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To: All Ships and Stations.

BUMED-C-LET
P2-3(084-42)

Subj: Navy Optical Units.

5 Oct 1943

1. Under authority contained in the Naval Appropriation Act for the fiscal year 1944 a number of optical units have been organized and equipped by the Bureau of Medicine and Surgery. The mission of these units is:

(a) First, to provide emergency spectacle replacement and repair service without charge to naval personnel in combat areas or other places not accessible to civilian facilities, and

(b) Second, to initially supply urgently needed corrective spectacles to naval personnel under like circumstances.

2. Types of units: In order to render this service adequately and to make it available to the greatest number in a given area, two types of units have been designed: A BASE type to be established at a relatively permanent location, and a MOBILE type to be transported from one location to another according to the demands. These units are prepared to provide corrective or replacement lenses sufficiently accurate to meet the needs of combat personnel. The units also are intended to supply corrective lenses for personnel, such as flight personnel, etc., requiring periodic eye examinations with special reference to the existence of various phorias.

3. For the operation of these optical units in fulfilling the mission stated in paragraph 1, the Secretary of the Navy, as required by the Appropriation Act, has specified the following:

REGULATIONS GOVERNING THE OPERATION OF NAVY OPTICAL UNITS

(a) Scope of work. Primarily, repair or replacement of spectacle frames or lenses which have been broken, damaged, or lost; and secondarily, the original construction of corrective lenses. These services will be available only to naval personnel on active duty at places not accessible to civilian facilities.

(b) In general, repair of lenses or frames, replacement of spectacles, or furnishing of initial spectacles shall be controlled by prescriptions issued by Medical Department officers except that when broken lenses are available for measurement, replacement may be made without prescription.

- (c) All frames and lenses are to be standardized.
- (d) None but standard frames to be repaired or supplied for naval personnel. Broken nonstandard frames will be replaced by standard frames.
- (e) Bifocal lenses shall not be supplied. If required, two pairs of spectacles (near and distant) shall replace bifocals.
- (f) Ordinarily but one pair of spectacles shall be supplied to an individual except as noted in paragraph (e).
- (g) No charges will be made for lenses or frames or services furnished naval personnel under these regulations.
- (h) Optical units shall be in charge of qualified personnel of the Medical Department of the Navy.
- (i) These optical units will possess no equipment for refraction, orthoptic training, or allied fields. They will not be prepared to deal with problems relating to precision optics, as in fire-control apparatus or photographic lenses.

4. Each unit, whether Base Type or Mobile Type, is a component of the Medical Department and carries technical personnel, officer and enlisted, selected on the basis of previous optical service and special training. Each unit will be assigned to a specific area by BuMed and will operate under the orders of the commanding officer of the area in the same manner that naval base hospitals and naval mobile hospitals are operated, subject to the directives and limitations expressed in the above regulations of the Secretary of the Navy and the technical instructions prepared by the Naval Medical Supply Depot, Brooklyn, New York, to accompany each unit.

ROSS T. McINTIRE
Rear Admiral (MC), USN
Chief of Bureau